$$=\frac{NK^2-BK^2}{MK^2-BK^2}.$$

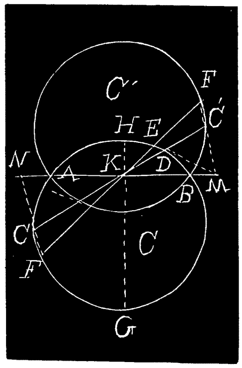
$\therefore\ NK^2.MK^2-NK^2.BK^2=NK^2.MK^2-MK^2.BK^2.$
$\therefore\ NK^2.BK^2=MK^2.BK^2.$
$\therefore\ NK=MK.$

II. **Solution by F. E. MILLER, A. M., Professor of Mathematics, Otterbein University, Westville, Ohio, and P. C. CULLEN, Indianola, Neb.**

K the mid-point of chord AB, and CD and EF chords through K.

To prove that the joins CF and ED meet AB equidistant from K.

Through A and B draw circles $C'\equiv C$ and produce CD and EF to C' and F'.



From symmetry we see that FC and $F'C'$ meet AB equidistant from K and are parallel.

$\angle EDC=\angle EFC=\angle EF'C'$ and hence $EDC'F'$ are concyclic. Then is $F'C'$ and ED meet in M, $MD.ME=$ $=MC'.MF'$, or the tangents from M to the circles C and C' are equal and therefore M is on the radical axis, *i. e.* on AB.

$\therefore\ NK=MK.$

Again by projection.

Project circle C on a plane through AB so that the projection of HG perpendicular to AB may have the projection of K as its mid-point. Then the circle becomes an ellipse with K as center and CD and EF as diameters, and ED and FC meeting the major axis AB equally distant from the center K. But points on AB are not changed by the projection. Therefore N and M are always equidistant from K.

A second solution by Analytical Geometry was furnished by Professor Zerr.

CALCULUS.

104. **Proposed by M. E. GRABER, Heidelberg University, Tiffin, Ohio.**

Find the differential equation corresponding to $\sqrt{(1-x^2)}+\sqrt{(1-y^2)}=[a(x-y)]$.

Solution by G. B. M. ZERR, A. M., Ph. D., The Temple College. Philadelphia, Pa.; COOPER D. SCHMITT, A. M., University of Tennessee, Knoxville, Tenn.; and the PROPOSER.

$\sqrt{(1-x^2)}+\sqrt{(1-y^2)}=a(x-y)\ldots.(1).$
$xdx/\sqrt{(1-x^2)}+ydy/\sqrt{(1-y^2)}=a(dy-dx)\ldots.(2).$

Eliminating a between (1) and (2) and reducing we get

$$\{xy-1-\sqrt{[(1-x^2)(1-y^2)]}\}\sqrt{[1-y^2]}dx$$
$$=\{xy-1-\sqrt{[(1-x^2)(1-y^2)]}\}\sqrt{[1-x^2]}dy.$$

$\therefore\ dx/dy=\sqrt{(1-x^2)}/\sqrt{(1-y^2)}.$